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The Determinants of Capital Structure Decisions: New Evidence from Turkish Companies

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Abstract

This study conducts a comparative test of trade-off theory and pecking order theory using 131 publicly traded Turkish companies' firm-level data between 2008 and 2014. The study also tries to exploit the differences between the capital structure decisions for various degrees of free float rate and foreign paid in capital, and for those that have various market values. According to the empirical results, although pecking order theory seems to better describe the capital structure of the firms, some of the determinants are suitable for trade-off theory. The results of the study also reveal that companies that have a free float rate between %50 and %75 have lower degrees of leverage and the degree of leverage varies for different market values of companies.

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Keywords: Economic growth; development index; development indicator; harmonic index

1. Introduction

Modern capital structure theory begins with the irrelevance theory of Modigliani and Miller (1958). Their pioneering work showed that in a perfect market- without taxes, information asymmetry, and transaction and bankruptcy costs, the degree of leverage is not associated with the firm value. Later, Kraus and Litzenberg (1973), took the effects of costs in their research, and pointed out a tradeoff between leverage and agency and bankruptcy costs with tax benefits. As an alternative to the trade-off theory, Myers and Majluf (1984), comes with the pecking order theory suggesting that, due to adverse selection, firms follows a financial hierarchy from internal to external financing and from debt to equity. Although each of these theories can explain only some aspects of capital structure formation, neither of them can extensively describe full aspects of capital structure.

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Since mid-1980s, there has been an extensive work that compares two major capital structure theories that are trade-off and pecking order with various data sets. Studies both from developed and developing world provide mixed results that some are supporting trade-off and some are supporting pecking order theories.

This paper contributes to the literature by testing two major theories with a relatively bigger listed firm data compared to many research with Turkish data and by investigating the degree of leverage for various degrees of free float rate, foreign paid in capital and for different market values of the firms. Panel data regression analyses is conducted to test the applicability of trade-off and pecking order theory using a number of firm-specific capital structure determinants as dependent variables and financial leverage representing capital structure as a dependent variable. Furthermore, degrees of leverage for different levels of free float rate, foreign paid in capital and for different market values of the firms are graphed to exploit the differences in capital structure decisions.

This paper follows with literature review, information about data and the methodology used. After revealing the empirical evidence, in last part, the study pinpoints the results and concludes.

2. Literature Review

After Modigliani and Miller (1958) pointed out the existence of an optimum capital structure and stated the irrelevance of leverage and firm value, Kraus and Litzenberg (1973) laid the foundations of trade-off theory pointing out the trade-off between leverage and costs. As pecking order theory has been explained by Myers and Majluf (1984), modern capital structure theories have started to being tested for various data sets for various time settings.

There is a vast amount of empirical studies that exploits the capital structure determinants mainly in USA for both listed and non-listed companies since early 1980s. Titman and Wessel (1998) showed a negative relationship between firm size and short term debts and a positive relationship between total debt and non debt tax shields, earnings volatility, tangibility, and growth opportunities. Harris and Raviv (1991) pointed out a negative relationship between debt/equity and profitability, growth opportunities and investment expenditures. In the work of Rajan and Zingales (1995), there appeared a negative relationship between the degree of leverage and profitability and a positive relationship between the degree of leverage and size with the tangibility. According to the results of the study, there does not exist a significant difference between the capital structure determinants among G-7 nations. Frank and Goyal (2009) found a positive relationship between financial leverage and tangibility, firm size, and negative relationship between financial leverage and growth opportunities with profitability. Empirical results of the study points that trade off theory better describes the capital structure.

Research in the determinants of capital structure and capital structures theories applicability has been a popular area also in Turkey since 1980s. The Turkish literature is mainly based on listed companies on Borsa Istanbul for various firms for various time periods. Empirical evidence in Turkish studies reveal that capital structure decisions of Turkish firms are mostly in accordance with pecking order (Durukan, 1997; Acaravcı and Doğukanlı, 2004; Sayılgan et.al., 2006; Demirhan, 2009; Ata and Ağ, 2010; Gülşen and Ülkütaş, 2012; Sarıoğlu et.al., 2013). On the other hand, while some empirical evidence shows that only trade-off theory is applicable (Sayılgan ve Uysal, 2011), some empirical evidence shows that both trade-off and pecking order theories are applicable (Korkmaz et.al., 2007; Yıldız et.al., 2009; Okuyan and Taşçı, 2010; Köksal and Orman, 2015).

This paper investigates the applicability of capital structure theories with a new data set of Turkish companies, and tries to reveal the differences in capital structure for different levels of free float rate, foreign paid in capital and for different market values of the firms.

3. Data and Methodology

The data set used in this study is financial data of 131 firms between 2008 and 2014 and drawn from Borsa Istanbul (BIST). Firm data in finance, service, utilities, and media sector is excluded due to differences in financial structure and accounting procedures.

The empirical analyses are conducted with balanced panel data regressions using the least squares error estimator. Eviews 7SV software package is used to conduct the analyses.

In order to make the comparative analyses between capital structure theories of trade-off and pecking order and exploit the significance of capital structure the determinants, the following model is estimated:

$$\mathbf{LEV_{it} = \alpha_i + \Sigma\ (Xj_{it})_t + \varepsilon it} \quad (1)$$

Variables used in the model are described in the following table. Calculations of independent variables are also shown and referred to previous empirical studies.

Table 1. Description of Variables

	Dependent Variable
LEV	Leverage (Total Liabilities/Total Assets
	Independent Variables (Firm-level Determinants)
X1	Size (Natural log of sales) (Titman and Wessel, 1998; Rajan and Zingales, 1995)
X2	Growth opportunities (Δ%in sales/ Δ%in assets) (Whited, 1992; Rajan and Zingales, 1995)
X3	Non debt tax shields (Amortization expense/total assets) (Barclay and Smith, 1995; Krishnaswami et. al., 1999)
X4	Profitability (EBIT/Total assets) (Titman and Wessel, 1998; Whited, 1992)
X5	Liquidity (S.T. Assets/S.T. Liabilities) (Ozkan, 2001)

Furthermore, regardless from estimated capital structure model, 131 listed firms are categorized according to different degrees of free float rate (<25%, 25%-50%, 50%-75%, >75%), foreign paid in capital (0%, <50%, >50%), and different market values (<100TL, 100-300TL, 300-500TL, 500-700TL, 700-1000TL, >1000TL, >2000TL).

4. Results

In this study the percentage change in GDP per capita and the percentage change in harmonic index over

Table 2. Panel Data Regression Results

	Leverage (Total Liabilities/Total Assets
Size	-0,003473
	(0.0003)*
Growth Opportunities	-1.497
	(0.0033)*
Non Debt Tax Shields	-1.164846
	(0.7583)
Profitability	-0.052685
	(0.0000)*
Liquidity	-0.00872
	(0.0001)*
# of Observations	927
# of Firms	131
Adjusted R Square	0.87575
F-Statistics	40.7755
Prob (F-Statistics)	0.0000

* Significance levels at the 5 % level

Panel data regression results are reported in the previous table. Regression results show that there exists a negative relationship between the degree of leverage (total liabilities/total assets) and size, growth opportunities, profitability and liquidity. On the other hand, non-debt tax shields variable has a positive effect on the degree of leverage. While the effect of size, growth opportunities, profitability, and liquidity is statistically significant, the effect of non-debt tax shield variable is statistically insignificant.

Below table compares the outputs of previous empirical studies on trade-off and pecking order theories and regression outputs of this study for the capital structure determinants used in the study.

Table 3. Comparative Summary of Regression Results and Theory Evidence Outputs

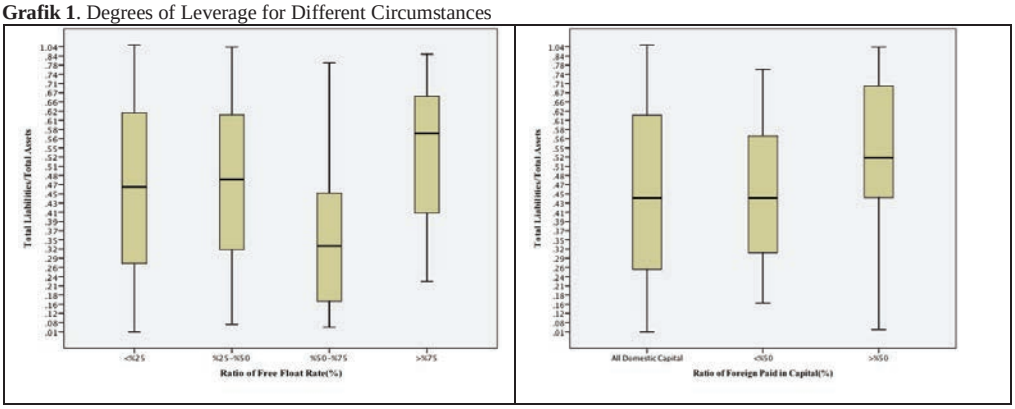
Firm-level Determinants	*Trade-off Theory*	*Pecking Order Theory*	*Regression Results*
Size	+	-	-
Growth Opportunities	-	+	-
Non Debt Tax Shields	-	(0)	+
Profitability	+	-	-
Liquidity	(0)	-	-

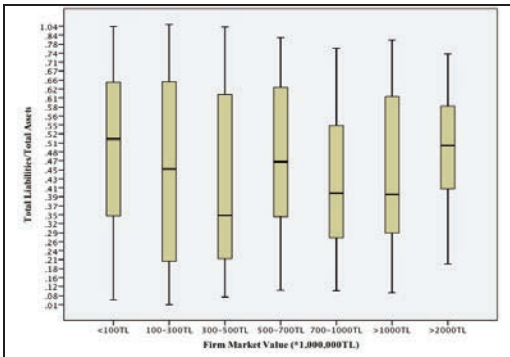
**(0) represents insignificany.*

As it can be observed from above table, the signs of variables- size, profitability, and liquidity are in accordance with pecking order theory. On the other hand, negative sign of growth opportunities variable is in accordance with trade-off theory. Sign of non-debt tax shields variable doesn't fit any of the theories; indeed, regression results reveal its insignificant effect on leverage.

Furthermore, in this study, sample firms are categorized according to different degrees of free float rate (<25%, 25%-50%, 50%-75%, >75%), foreign paid in capital (0%, <50%, >50%), and different market values (<100TL, 100-300TL, 300-500TL, 500-700TL, 700-1000TL, >1000TL, >2000TL) and these categories are graphed against the leverage degree.

Grafik 1. Degrees of Leverage for Different Circumstances





As observed in above graphics, firms with free float rate of 50%-75% have drastically lower value of leverage compared to those with other levels of free float rates. In addition, firms with foreign paid in capital higher than 50% have slightly higher degree of leveragee among other groups. Finally, it is observed that firms with different market values have different leverage degrees, however, this doesn't follow a pattern.

5. Conclusion

This study tries to examine the capital structure determinants for listed non-financial Turkish firms. Results of the study reveal that although pecking order theory better describes the capital structure of Turkish firms, some of the capital structure determinants are in accordance with trade-off theory. Furthermore, this study investigates the differences in degrees of leverage, regardless from estimated capital structure model, for different levels of free float rate, foreign paid in capital and for different market values of the firms are graphed to exploit the differences in capital structure decisions.

This study should be developed in two major ways. Firstly, use of an extended data set that includes non-listed firms and both firm-level and macro-level determinants in regression analyses shall enable a better description of capital structures of Turkish firms and provide information in more detail Secondly, estimation of individual panel regression models under various circumstances of free float rate, foreign paid in capital, market value will allow to compare the determinants of capital structure for different categories of Turkish firms and to understand how these various circumstances affect the formation of capital structure.

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